CTS HERITAGE

HERITAGE SCREENER

CTS Reference Number:	**CTS23_101**
SAHRA Case No.	
Client:	**Savannah**
Date:	**May 2023**
Title:	**EA AMENDMENT FOR KAROSHOEK GRID INTEGRATION INFRASTRUCTURE, NORTHERN CAPE.**

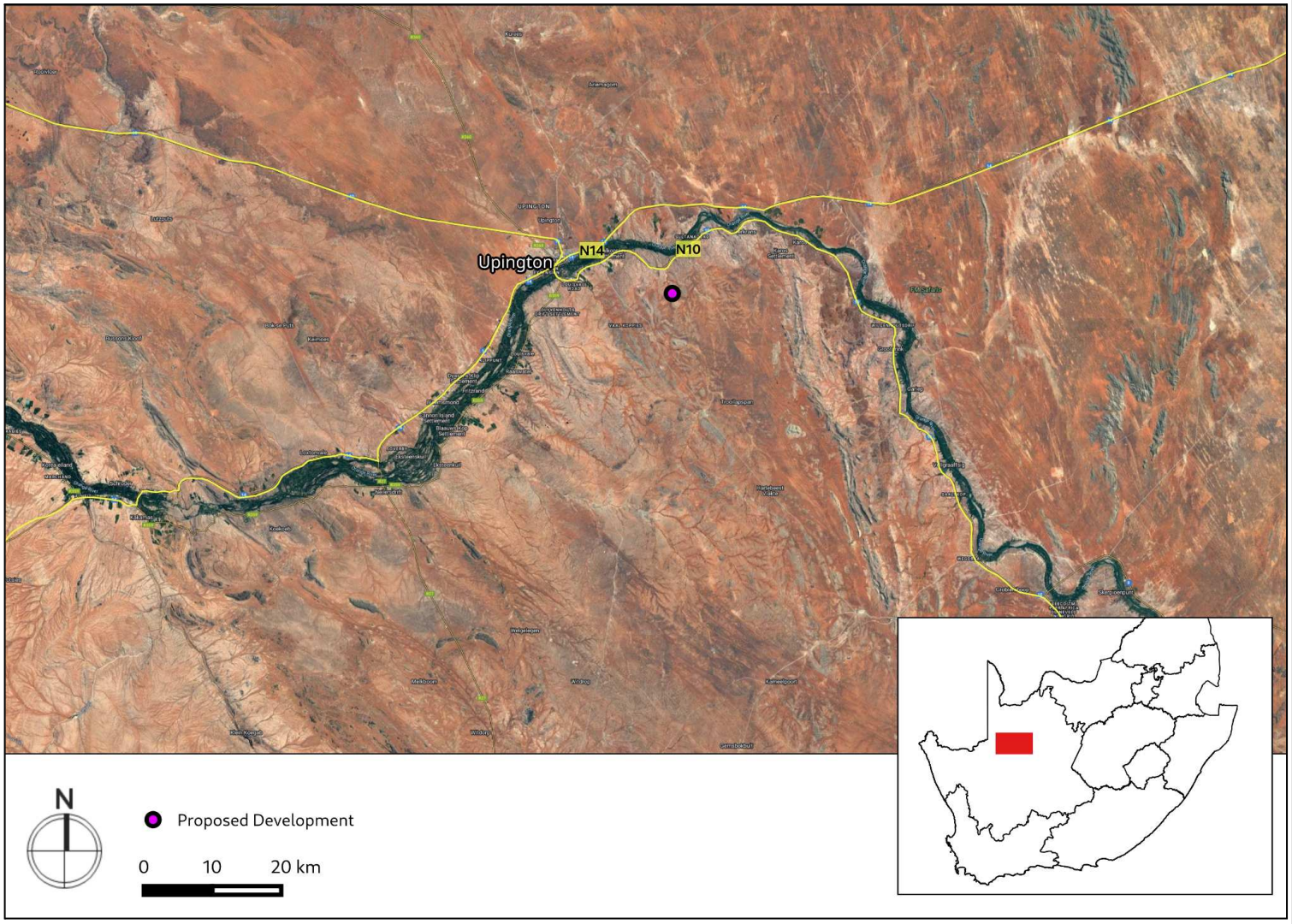

Figure 1a. Satellite map indicating the location of the proposed development in the Northern Cape

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1. Proposed Development Summary

FG Emvelo (Pty) Ltd is proposing to amend the Environmental Authorisation (EA) for the Karoshoek Grid Integration Infrastructure i.e. on-site substation/switching yard and 400kV powerline from site 1.4, 3, 4, and 5 to the feature Eskom MTS 400kV power line proposed to the west of the site, as part of the larger Karoshoek Solar Valley Development, 30km east of Upington, within the Khara Hais Local Municipality in the Northern Cape Province, by extending the EA validity by an additional ten (10) years. Extension of the validity of the EA will ensure that the EA remains valid for the undertaking of the authorised activities.

Condition 6 of the EA states that the activity must commence within a period of three (3) years from the date of issue. The Environmental Authorisation (EA) for the project was issued on 20 March 2013. The validity of the EA was extended for an additional two years on 11 November 2015 (DEA Ref: 14/12/16/3/3/2/288/AM1) and by an additional 5 years on 11 April 2018 will lapse on 20 March 2023. FG Emvelo requests an extension of the validity of the EA by an additional ten years. Condition 6 of the EA is requested to be amended from:
“This activity must commence within a period of three (3) years from the date of issue”
To:
“This activity must commence within a period of twenty (20) years from the date of issue”.

The Karoshoek Solar Valley projects will form part of the proposed Upilanga Solar and Green Hydrogen Park development, located at Karoshoek, Upington, Northern Cape Province, South Africa. Upilanga Solar and Green Hydrogen Park falls under the Green Hydrogen National Program Strategic Infrastructure Project (SIP) No. 20e, which was gazetted by the Honourable Minister Patricia De Lille in Government Gazette 437658 on 6 December 2022. Therefore, the applicant is requesting that the validity of the EA be extended. This will ensure that the EA remains valid for the undertaking of the authorised activities such that the project can be incorporated into this SIP registered project.

2. Application References

Name of relevant heritage authority(s)	SAHRA
Name of decision making authority(s)	DFFE

3. Property Information

Latitude / Longitude	28°31′02.66″S, 21°30′23.34″E
Erf number / Farm number	Farm 2/41, Farm 72/41
Local Municipality	Dawid Kruiper
District Municipality	Z F Mgcawu
Current Zoning	Agriculture

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4. Nature of the Proposed Development

Total Area	TBA
Depth of excavation (m)	TBA
Height of development (m)	TBA

5. Category of Development

x	**Triggers: Section 38(8) of the National Heritage Resources Act**
	Triggers: Section 38(1) of the National Heritage Resources Act
	1. Construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier over 300m in length.
	2. Construction of a bridge or similar structure exceeding 50m in length.
	3. Any development or activity that will change the character of a site-
x	a) exceeding 5 000m^2 in extent
	b) involving three or more existing erven or subdivisions thereof
	c) involving three or more erven or divisions thereof which have been consolidated within the past five years
	4. Rezoning of a site exceeding 10 000m^2
	5. Other (state):

6. Additional Infrastructure Required for this Development

NA

7. Mapping (please see Appendix 3 and 4 for a full description of our methodology and map legends)

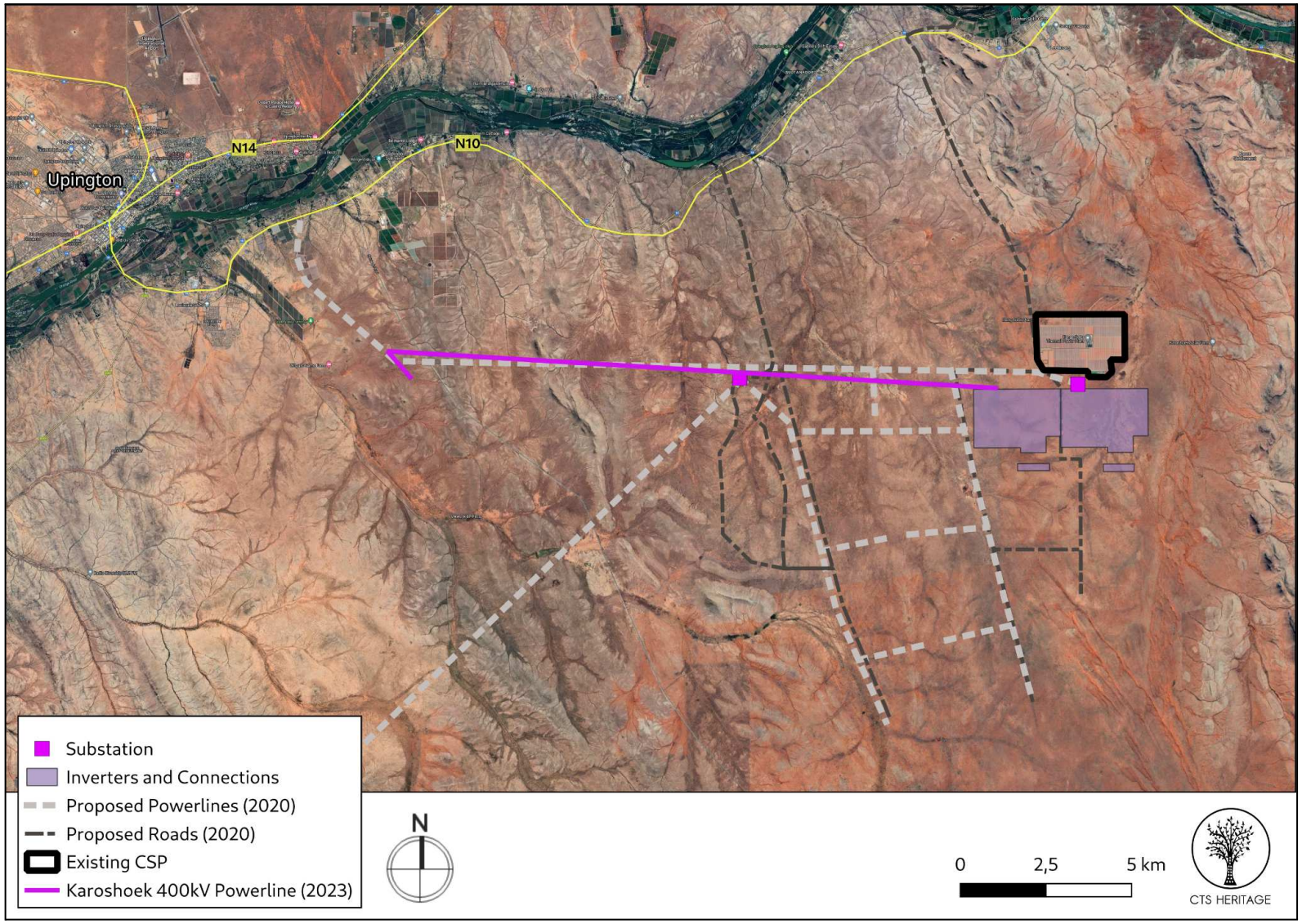

Figure 1b. Overview Map. Satellite image (2023) indicating the proposed development area overlaying the area assessed in 2020.

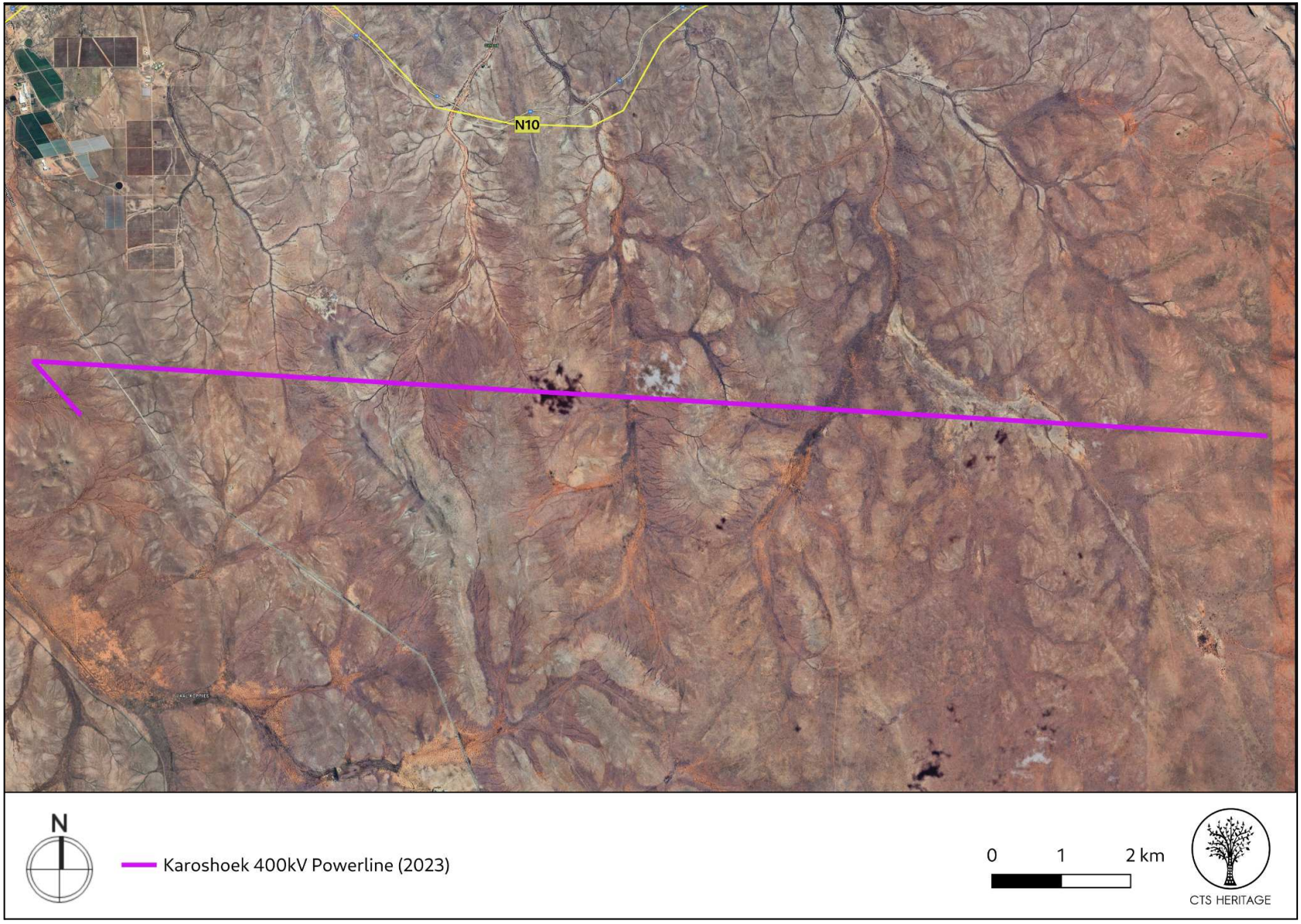

Figure 1c. Overview Map. Satellite image (2023) indicating the proposed development area in the Northern Cape.

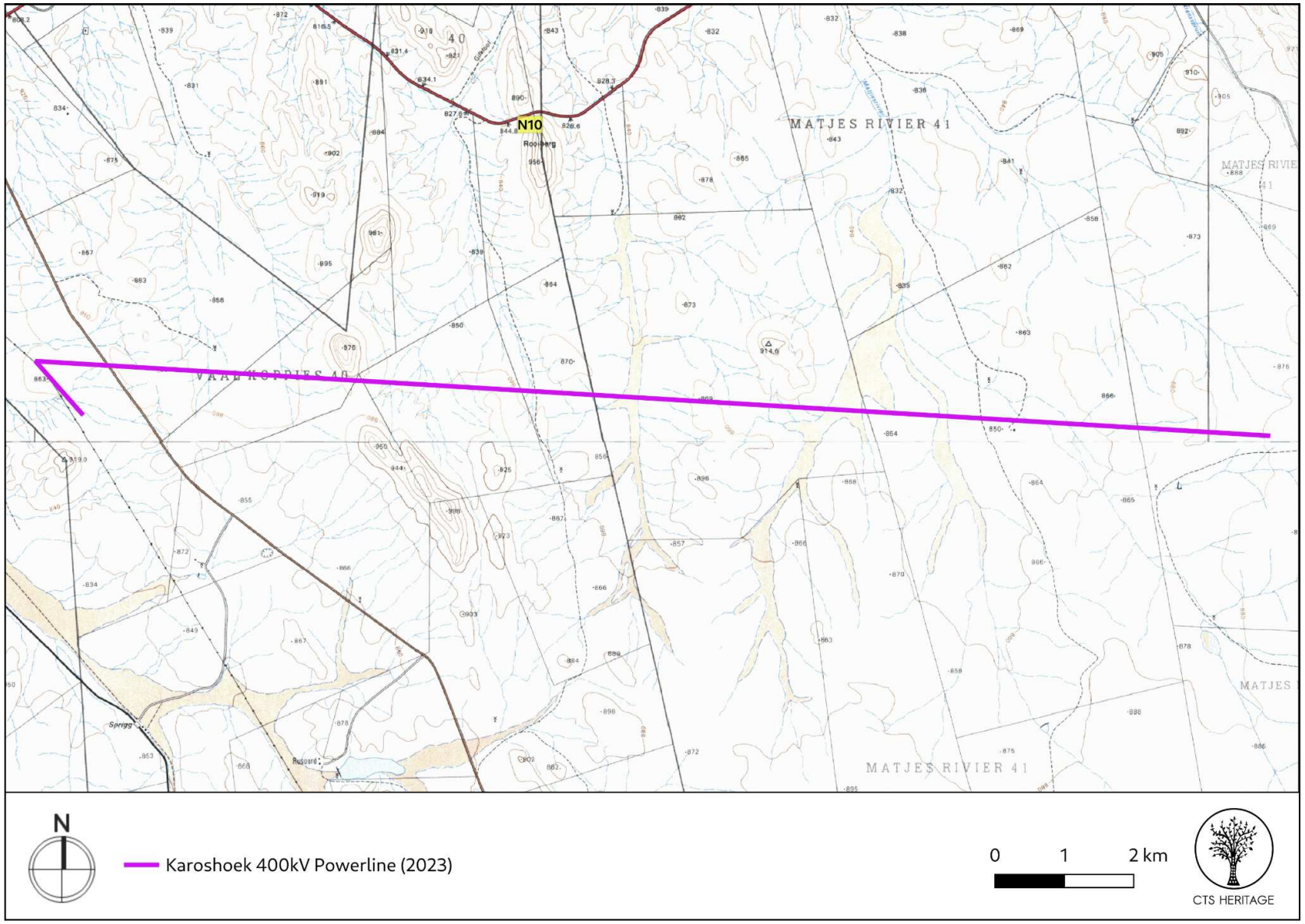

Figure 1d. Overview Map. Extract from the 1:50 000 Topo map indicating the proposed development area.

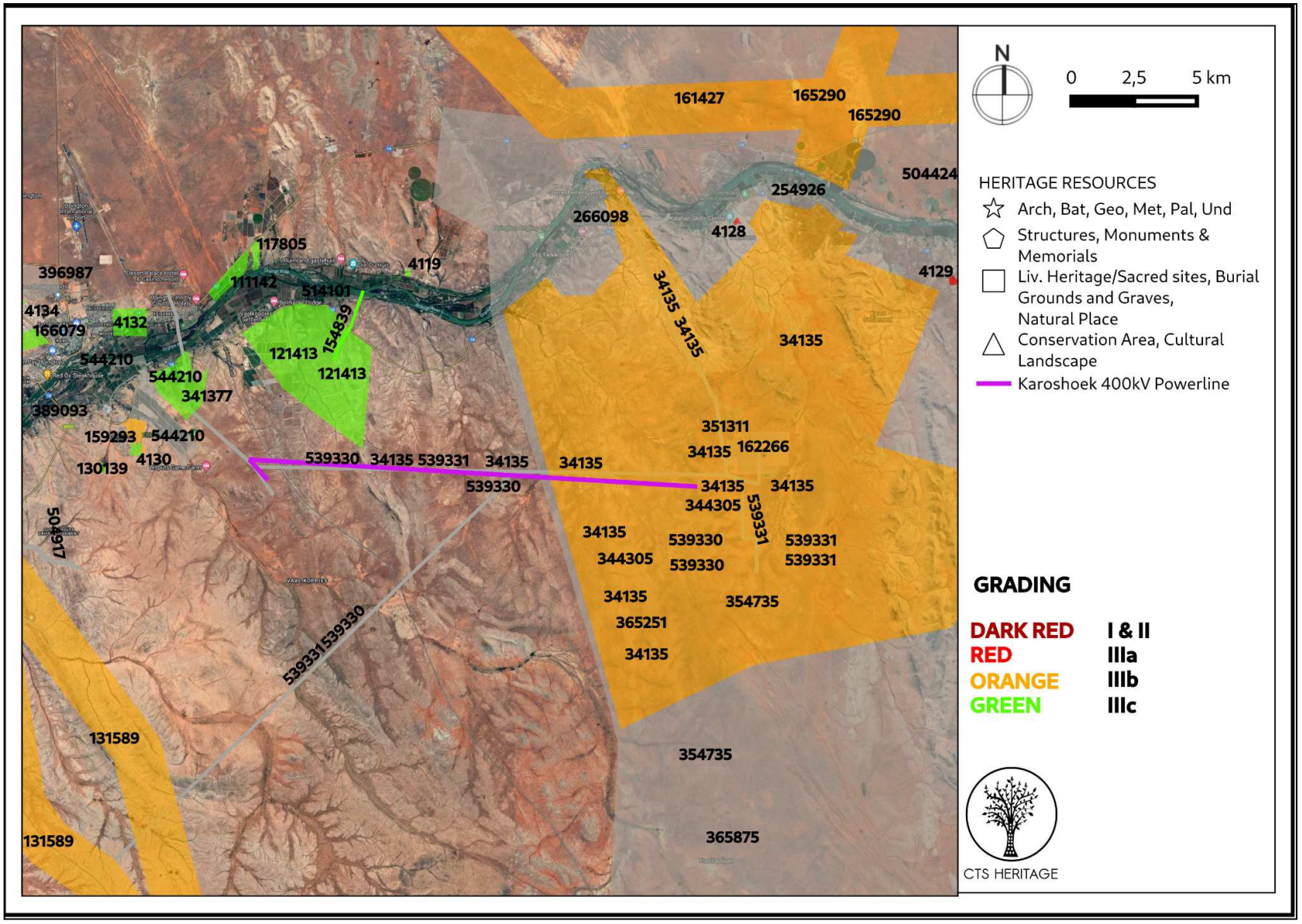

Figure 2a. Previous HIAs Map. Previous Heritage Impact Assessments covering the proposed development area with SAHRIS NIDS indicated. Please see Appendix 2 for a full reference list.

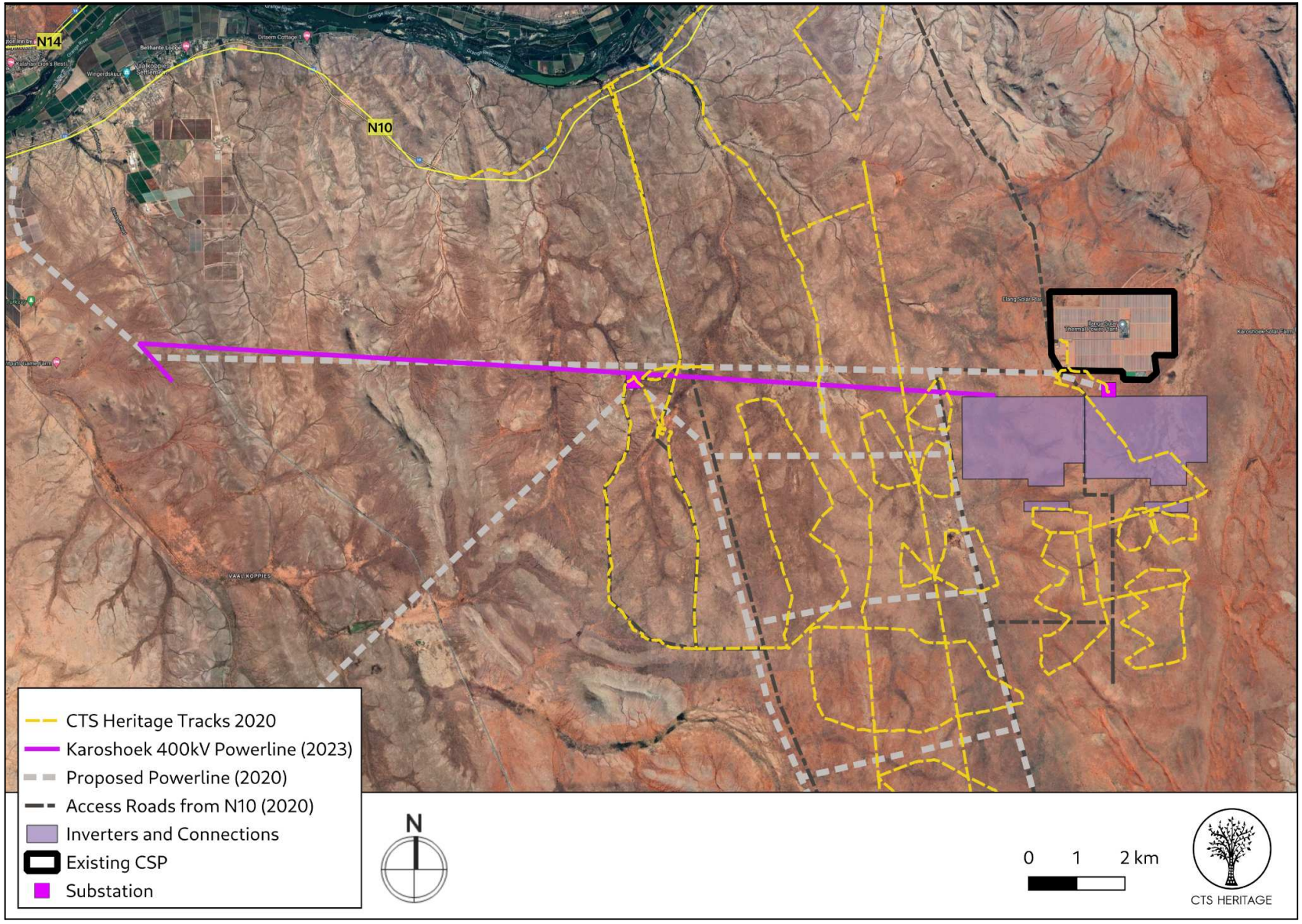

Figure 2b. Previous HIAs Map. Trackpaths of the field assessment completed by CTS Heritage in 2020

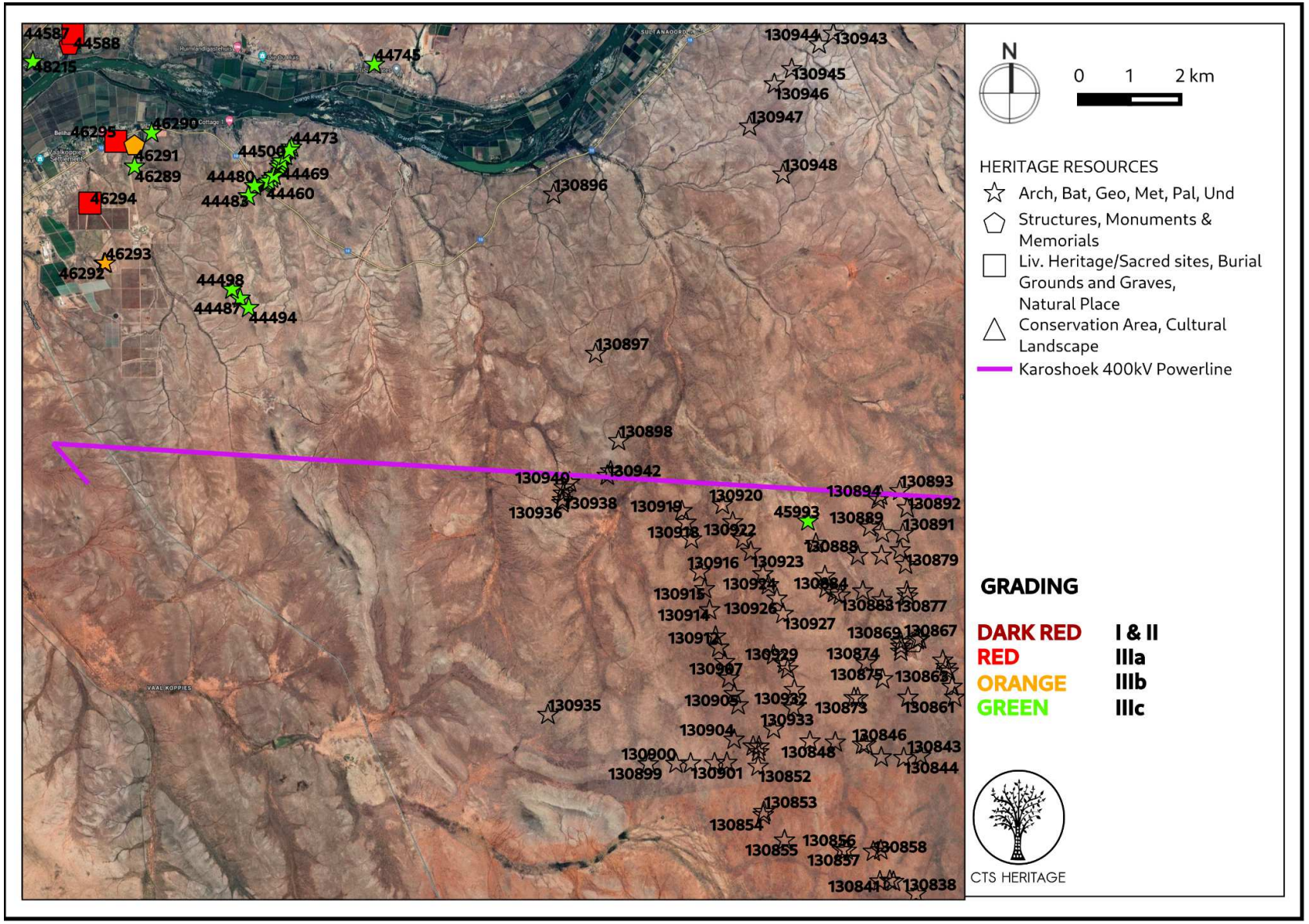

Figure 3. Heritage Resources Map. Heritage Resources previously identified within the study area, with SAHRIS Site IDs indicated in the insets below. Please See Appendix 4 for a full description of heritage resource types.

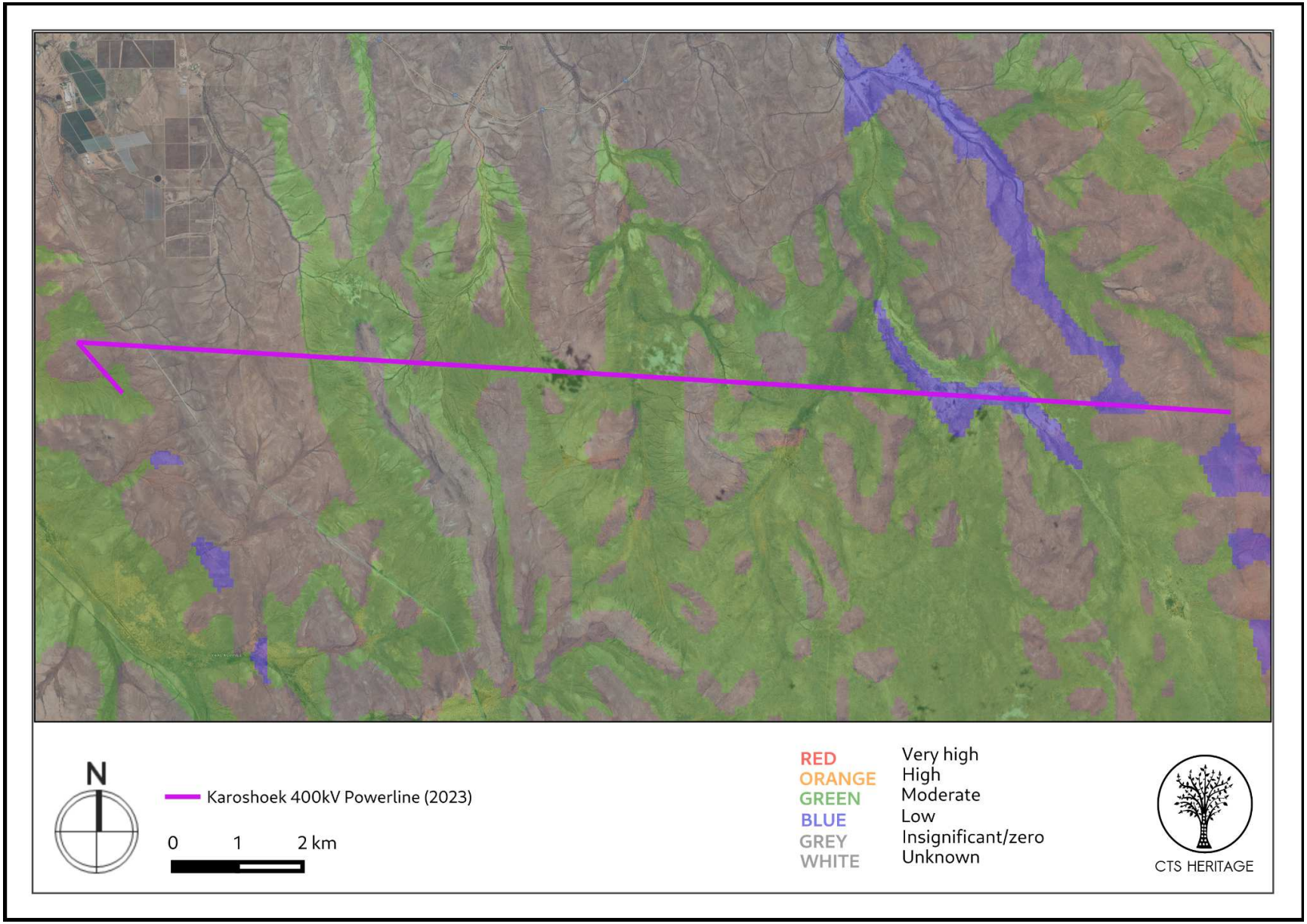

Figure 4a. Palaeosensitivity Map. Indicating fossil sensitivity underlying the study area. Please See Appendix 3 for a full guide to the legend.

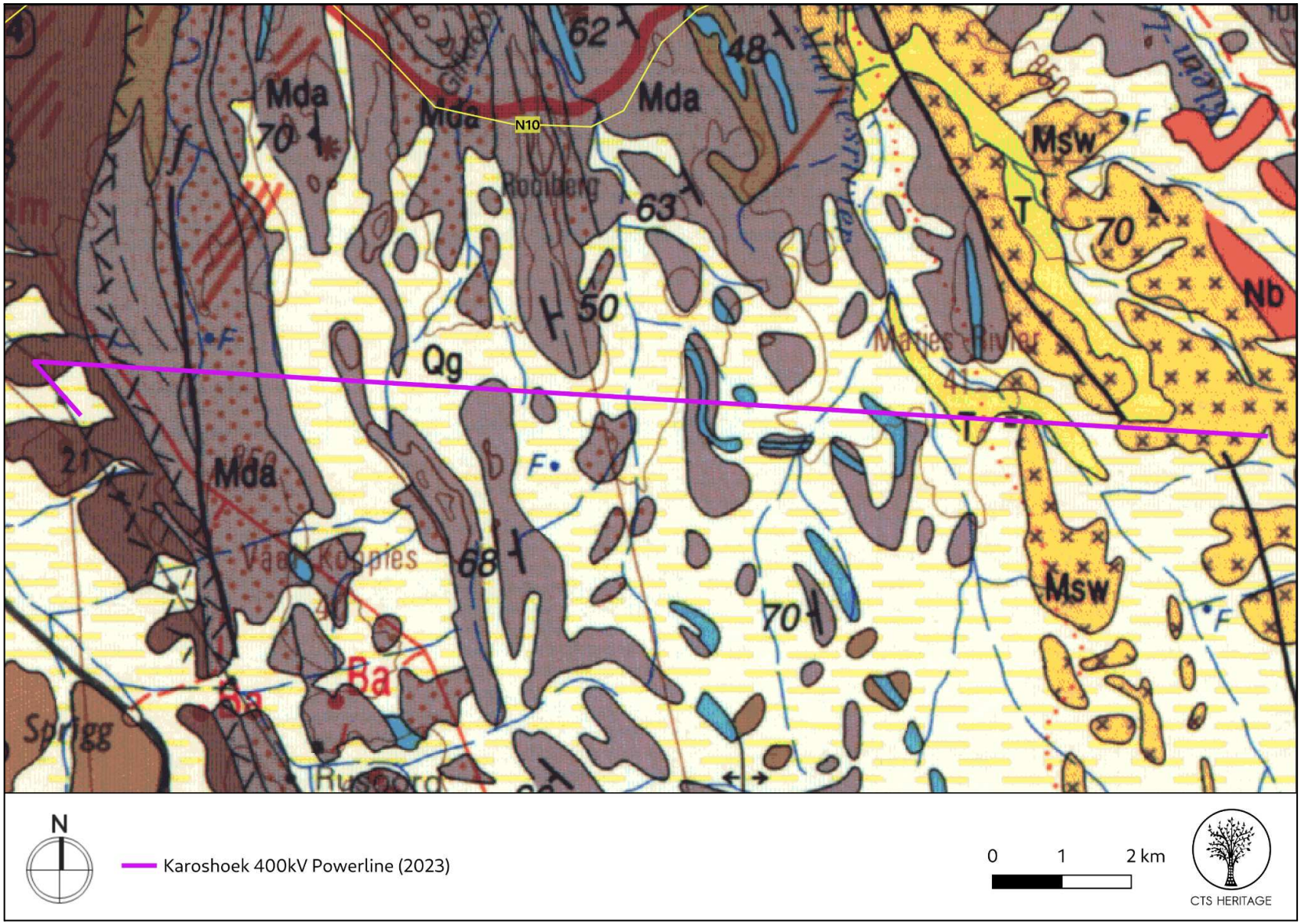

Figure 4b. Geology Map. Extract from the Council of GeoScience Geology Map tile 2820 for Upington indicating that the area proposed for development is underlain by Qg: Gordonia Formation Cobersands; Mda: Dagbreek Formation and Msw: Sanarts Gneiss

8. Desktop Heritage Assessment

Introduction

This application is for the amendment of an existing EA for the development of a 400kV powerline associated with the Karoshoek Solar Valley Development located 30km east of Upington. An HIA was completed by Gaigher (2012) as part of the process followed for the Karoshoek Solar Valley Project (Case 210). Condition 6 of the existing EA for the Karoshoek Grid Connection is requested to be amended from:

"This activity must commence within a period of three (3) years from the date of issue"

To:

"This activity must commence within a period of twenty (20) years from the date of issue".

In 2020, CTS Heritage completed an HIA process for the proposed development of the Ilanga PV Facilities (Figure 2b). The existing Karoshoek Solar Farm was completed towards the end of 2018 and lies to the north and north east of the areas surveyed by CTS Heritage for the Ilanga solar installations. The assessment completed by CTS Heritage in 2020 as well as the findings of Gaigher (2012) are used in the assessment below.

Cultural Landscape and Built Environment

The area proposed for development is located approximately 20km east of Upington. Upington originated as a mission station established along the banks of the Orange River in 1871 and run by Reverend Christiaan Schröder, and was founded as a town in 1873. According to Gaigher (2012, SAHRIS ID 34135), prior to colonial settlement, this area was occupied by the Korana who had been forced to the outskirts of the Cape Colony along the Gariep River. When this area was eventually settled by colonists, war broke out between the colonial settlers and the Korana, who were then dispersed upon their defeat.

Upington has been noted as being the sunniest location on the planet for three months of the year, from November through to January, which is likely why this area has been earmarked for the development of renewable energy facilities as part of the Karoshoek Solar Valley development. The geomorphology of the area has been described by Van Schalkwyk (2011, SAHRIS ID 162266) as irregular plains with hills occuring to the south. The vegetation is described as Orange River Nama Karoo. Van Schalkwyk (2011) further notes that the area proposed for development were used for grazing purposes and no farmsteads were constructed this far from the Orange River.

In the assessment completed by CTS Heritage in 2020, the receiving environment is described as "nearly entirely level and flat apart from a low dune cordon in the far southwest. Quartzite dominated higher ground lies to the north and is situated between the areas surveyed and the N10 highway running between Upington and Groblershoop. This will provide much of the visual cover for the new facilities from the northern end. The vegetation is predominantly Bushmanland Arid Grassland vegetation in the Nama-Karoo biome (Mucina & Rutherford 2006) which consists of Karoo scrub and grass and a few isolated Acacia karoo trees. Red Kalahari aeolian sands cover most of the site and there are many areas where the calcrete beneath the Kalahari sands is exposed. Dolerite sills, exposed quartz veins and quartzitic bedrock outcrops in low (40cm high) formations occur sporadically across the study site."

According to Van Schalkwyk (2014 SAHRIS NID 170520), "The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a pre-colonial (stone age) component and a later colonial (farmer) component. This rural landscape has always been sparsely populated. The second component is an urban one, consisting of a number of smaller towns, most of which developed during the last 150 years or less." According to Von Vollenhoven (2012 SAHRIS NID 117902), "the environment of the area is mostly undisturbed although it is being used for sheep farming... The natural topography… is reasonably flat, but in the north-west a hill dominates the area resulting in an even slope up to the crest. This area also is very rocky. The stones here are dark in colour and may be of a basaltic origin. However in the flat areas adjacent to the hill the rocks are white coloured and most likely are soft calcrete, which would not have been suitable for the manufacture of stone tools. Different non-perennial

streams run through the area…" According to Fourie's assessment of the impacts of similar infrastructure in this area (2014), due to the landscape's topography the grid infrastructure will be prominent in the landscape and may alter the rural appearance. Due to the remoteness of the area the impact on the experience of the cultural landscape is not foreseen to be significant.

Archaeology

Many farm portions in the immediate vicinity of the area proposed for development have been assessed in terms of impacts to heritage resources (Figure 2). It has been found that the area surrounding Upington has a rich historical and archaeological past (Fourie, 2014 SAHRIS NID 174335). Based on the outcomes of these assessments, it is noted that most of the heritage resources identified are stone age artefact scatters of varying significance. In Fourie's assessment (2014), the field work identified numerous areas where low density scatters of Middle and Later Stone Age lithics were found. As no context and *in situ* preservation were identified these sites were graded as having low heritage significance. In addition, one possible herder site was identified during the survey. No other material or deposits were identified but does not exclude the possibility of subsurface material. The ruins of old mining infrastructure were also identified. In Von Vollenhoven's assessment (2012 SAHRIS NID 117902), he identified a number of very interesting and significant rock art engravings depicting various animals including giraffes and an aardvark. In addition, he identified a significant historical site known as the "Rebellion Tree" as well as graves associated with farmers in this area.

Numerous Renewable Energy developments have been proposed for this area as part of the Karoshoek Solar Valley development and each of these proposed developments have undergone assessments for impacts to archaeological resources (Figure 2). Areas located to the south-east of the study area were surveyed by Sampson (1985), revealing a number of Karoo stone age sites, however similar densities of stone age sites are not known from the proposed development area. In his assessment, Van Schalkwyk (2011) identified a number of Later Stone Age artefacts associated with a non-perennial stream that traverses the development area, as well as along the outer edges of a pan (graded III). He also identified two small historic structures in the study area made of clay bricks of low heritage significance. Gaigher (2012, SAHRIS ID 34135) also assessed this area for impacts to archaeological resources. Gaigher identified "limited scatterings of Middle to Later Stone Age tools found in various areas". He notes that these finds in themselves do not constitute sites, but do indicate the possible occurrence of such sites. The heritage resources identified in these reports have been extracted and mapped in Figures 3a to 3e. Further archaeological impact assessment work has been completed in this area by Van der Walt (2015 and 2016 - see Appendix 2). Van der Walt notes that the various assessments conducted in this area provide a robust baseline for the archaeology expected in this area. "These studies show that almost no significant archaeological sites occur within the immediate vicinity of the Ilanga Solar Facility. Although artefacts dating to the Early, Middle and Later Stone Age were recorded in the larger area, they occur as isolated finds that are temporally mixed, in deflated and un-stratified contexts without organic remains and other cultural materials. As a result, the archaeological record of the larger area is considered to be of low significance."

The archaeological field assessment completed by CTS Heritage for the Ilanga PV Facility covered some of the area proposed for development. Stone Age archaeological resources were identified within the development footprint, however these are considered to be not conservation-worthy as they are widely scattered and have no associated contextual material. The findings made during the field assessment were consistent with previous work undertaken in the area. Larger quantities of debitage were found where quarrying of quartz and quartzite had taken place, hornfels percentages climbed in areas closer to the Orange River to the north and east of the study site and almost all of the observations were of Middle Stone Age material. Later Stone Age remains were very sparse and limited across the study site. No engravings, formal or informal graves were identified within the development footprint and the only built structures included modern cattle farming kraals, jeep tracks and fences.

The stone age occurrences identified consist of isolated finds, and low-density ex-situ surface scatters containing predominantly of Middle Stone Age (MSA) material, with a few incidences of Later Stone Age (LSA) lithics. Whether indicative of the original discard patterns, or subsequent displacement by erosion and animal activity, the material is too scattered to be connected to knapping sites, and no evidence of concurrent human occupation was found in association with the lithics. The identified archaeological materials are therefore of low significance, as the archaeological sample is small and without context, and therefore of little scientific value. These Stone Age heritage finds are considered not

conservation-worthy. This means these sites have been sufficiently recorded and no further action is required.

Based on the known archaeological sensitivity of the area, as well as the findings of the initial assessment for the Karoshoek development (Gaigher, 2012), it is very unlikely that the proposed amendment to the EA will negatively impact on significant archaeological heritage resources.

Palaeontology

According to Almond's Desktop PIA for the proposed additional CSP sites within the Karoshoek Solar Valley (November 2015, SAHRIS ID 344305), the development area is underlain by PreCambrian basement rocks as well as late Caenozoic superficial sediments. Almond (2015) further notes that "The Precambrian igneous and metamorphic basement rocks underlying the entire study area at depth are entirely **unfossiliferous**. The fossil record of the Pleistocene to Recent Kalahari Group is generally sparse and low in diversity. The Gordonia Formation dune sands were mainly active during cold, drier intervals of the Pleistocene Epoch that were inimical to most forms of life, apart from hardy, desert-adapted species. **Porous dune sands are not generally conducive to fossil preservation**. However, mummification of soft tissues may play a role here and migrating lime-rich groundwaters derived from the underlying bedrocks (including, for example, dolerite) may lead to the rapid calcretisation of organic structures such as burrows and root casts. Occasional terrestrial fossil remains that might be expected within this unit include calcretized rhizoliths (root casts) and termitaria (*e.g. Hodotermes*, the harvester termite), ostrich egg shells (*Struthio*) and shells of land snails (*e.g. Trigonephrus*) (Almond 2008, Almond & Pether 2008). Other fossil groups such as freshwater bivalves and gastropods (*e.g. Corbula, Unio*) and snails, ostracods (seed shrimps), charophytes (stonewort algae), diatoms (microscopic algae within siliceous shells) and stromatolites (laminated microbial limestones) are associated with local watercourses and pans. Microfossils such as diatoms may be blown by wind into nearby dune sands. These Kalahari fossils (or subfossils) can be expected to occur sporadically but widely, and **the overall palaeontological sensitivity of the Gordonia Formation is therefore considered to be low**. Underlying calcretes of the Mokolanen Formation might also contain trace fossils such as rhizoliths, termite and other insect burrows, or even mammalian trackways. It is noted that potentially fossiliferous alluvial gravels of Neogene or Quaternary age ("High Level Gravels") associated with the Orange River are *not* mapped within the present study area."

The study area is therefore largely underlain by unfossiliferous Precambrian basement rocks of the Namaqua-Natal Province as well as a range of unfosssiliferous to poorly-fossiliferous superficial sediments of Late Caenozoic age. The construction phase of the development will entail extensive surface clearance as well as shallow excavations into the superficial sediment cover (soils, alluvial gravels etc.) and locally also into the underlying bedrock. These excavations notably include site clearance activities as well as excavations for the power line pylon footings. As noted above, however, the overall palaeontollogical sensitivity of the area proposed for the powerline development is LOW. Based on this known palaeontological sensitivity of the area, as well as the findings of the initial assessment for the Karoshoek development (Almond, 2015), it is very unlikely that the proposed amendment to the EA will negatively impact on significant palaeontological heritage resources.

Site Sensitivity Verification

According to the DFFE Screening Tool analysis, the development area has MEDIUM levels of sensitivity for impacts to palaeontological heritage and VERY HIGH levels of sensitivity for impacts to archaeological and cultural heritage resources. The results of this assessment in terms of site sensitivity are summarised below:

- The cultural value of the broader area has some significance (MEDIUM)
- Limited significant archaeological resources were identified within the broader area (LOW)
- No highly significant palaeontological resources were identified within the development area, and the geology underlying the development area is not sensitive for impacts to significant fossils (LOW)

As per the findings of this assessment, and its supporting documentation, the outcome of the sensitivity verification disputes the results of the DFFE Screening Tool for Palaeontology - this should be considered to be LOW, and disputes the results of the screening tool for archaeology and cultural heritage - this should be considered to be MODERATE. This evidence is provided in the body of this report.

Statement on environmental processes impacting on archaeological and palaeontological heritage
Archaeological and palaeontological heritage resources reflect the environments of the deeper past and are unlikely to change significantly in as short a geological time span as 10 years. Some changes to heritage resources may result from processes of erosion and deflation but, in this particular ecological setting, would likely represent heavily disturbed contexts and consequently would be of limited scientific/heritage value.

EA Amendment
In SAHRA's response to the 2012 HIA, they note that;
"Although no palaeontological study of the area was compiled, SAHRA is satisfied that the metamorphic rocks and granites that underly the study area are unfossiliferous and that the project poses little threat to significant fossil resources.

As the archaeological resources in the area are of low significance, the SAHRA Archaeology, Palaeontology and Meteorites Unit has no objection to the development (in terms of the archaeological and palaeontological components of the heritage resources) on condition that, if any new evidence of archaeological sites or artefacts, palaeontological fossils, graves or other heritage resources are found during development, construction or mining, SAHRA and an archaeologist and/or palaeontologist, depending on the nature of the finds, must be alerted immediately."

In light of the above, there is no heritage objection to granting the proposed amendment to the EA for the Karoshoek grid connection based on the current site conditions on condition that the recommendations made in the original HIA completed for this project (Gaogher, 2012) are adhered to.

Conclusion
Based on the information provided above, it is not anticipated that the proposed development will have a negative impact on any archaeological, palaeontological, built environment or cultural landscape heritage resources.

RECOMMENDATION
Based on the information available, it is not likely that the proposed amendment will impact on significant heritage resources and as such, it is recommended that no further heritage assessments are required.

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APPENDIX 1

List of heritage resources within the development area

Site ID	Site no	Full Site Name	Site Type	Grading
45504	UPING01	Upington 01	Artefacts	Grade IIIa
45507	UPING04	Upington 04	Artefacts	
45509	UPING06	Upington 06	Artefacts	Grade IIIa
45511	UPING08	Upington 08	Structures	Grade IIIc
45512	UPING02	Upington 02	Artefacts	Grade IIIa
45513	UPING03	Upington 03	Artefacts	
45514	UPING05	Upington 05	Artefacts	Grade IIIa
45515	UPING07	Upington 07	Structures	Grade IIIc
46292	VKPS22	Vaalkoppies 22	Artefacts	Grade IIIb
46293	VKPS23	Vaalkoppies 23	Artefacts	Grade IIIb
44487	VKPS17	Vaalkoppies 17	Artefacts	Grade IIIc
44494	VKPS18	Vaalkoppies 18	Artefacts	Grade IIIc
44498	VKPS16	Vaalkoppies 16	Artefacts	Grade IIIc
45992	KARO003	Karoshoek 003	Artefacts	Grade IIIb
45993	KARO004	Karoshoek 004	Artefacts	Grade IIIc
39446	KHARA001	Khara Hais 001	Artefacts	Grade IIIa
39447	KHARA002	Khara Hais 002	Artefacts	Grade IIIa

39448	KHARA003	Khara Hais 003	Artefacts	Grade IIIa
39449	KHARA004	Khara Hais 004	Artefacts	Grade IIIa
39450	KHARA005	Khara Hais 005	Artefacts	Grade IIIa
39451	KHARA006	Khara Hais 006	Artefacts	Grade IIIa
39452	KHARA007	Khara Hais 007	Building	Grade IIIc
39453	KHARA008	Khara Hais 008	Structures	Grade IIIc
131957	FVK001	Farm Vaalkoppies	Archaeological	Grade IIIc
131958	FVK002	Farm Vaalkoppies	Artefacts	Grade IIIc
131959	FVK003	Farm Vaalkoppies	Artefacts	Grade IIIc
131960	FVK004	Farm Vaalkoppies	Artefacts	Grade IIIc
131962	FVK005	Farm Vaalkoppies	Artefacts	Grade IIIc
131963	FVK006	Farm Vaalkoppies	Artefacts	Grade IIIc
130781	ILAN01	ILanga PV	Artefacts	
130782	ILAN02	ILanga PV	Artefacts	
130783	ILAN03	ILanga PV	Artefacts	
130784	ILAN04	ILanga PV	Artefacts	
130785	ILAN05	ILanga PV	Artefacts	
130786	ILAN06	ILanga PV	Artefacts	
130789	ILAN07	ILanga PV	Artefacts	
130790	ILAN08	ILanga PV	Artefacts	

130791	ILAN09	ILanga PV	Artefacts	
130793	ILAN010	ILanga PV	Artefacts	
130794	ILAN011	ILanga PV	Artefacts	
130795	ILAN012	ILanga PV	Artefacts	
130796	ILAN013	ILanga PV	Artefacts	
130797	ILAN014	ILanga PV	Artefacts	
130798	ILAN015	ILanga PV	Artefacts	
130801	ILAN018	ILanga PV	Artefacts	
130802	ILAN019	ILanga PV	Artefacts	
130803	ILAN020	ILanga PV	Artefacts	
130805	ILAN022	ILanga PV	Artefacts	
130806	ILAN023	ILanga PV	Artefacts	
130807	ILAN024	ILanga PV	Artefacts	
130808	ILAN025	ILanga PV	Artefacts	
130814	ILAN026	ILanga PV	Artefacts	
130815	ILAN027	ILanga PV	Artefacts	
130816	ILAN028	ILanga PV	Artefacts	
130817	ILAN029	ILanga PV	Artefacts	
130818	ILAN030	ILanga PV	Artefacts	
130819	ILAN031	ILanga PV	Artefacts	

130820	ILAN032	ILanga PV	Stone walling	
130821	ILAN033	ILanga PV	Artefacts	
130822	ILAN034	ILanga PV	Artefacts	
130823	ILAN035	ILanga PV	Artefacts	
130824	ILAN036	ILanga PV	Artefacts	
130825	ILAN037	ILanga PV	Artefacts	
130826	ILAN038	ILanga PV	Artefacts	
130827	ILAN039	ILanga PV	Artefacts	
130828	ILAN040	ILanga PV	Artefacts	
130829	ILAN041	ILanga PV	Artefacts	
130830	ILAN042	ILanga PV	Artefacts	
130831	ILAN043	ILanga PV	Artefacts	
130832	ILAN044	ILanga PV	Artefacts	
130833	ILAN045	ILanga PV	Artefacts	
130834	ILAN046	ILanga PV	Artefacts	
130835	ILAN047	ILanga PV	Artefacts	
130836	ILAN048	ILanga PV	Artefacts	
130837	ILAN049	ILanga PV	Artefacts	
130838	ILAN050	ILanga PV	Artefacts	
130839	ILAN051	ILanga PV	Artefacts	

130840	ILAN052	ILanga PV	Artefacts	
130841	ILAN053	ILanga PV	Artefacts	
130842	ILAN054	ILanga PV	Artefacts	
130843	ILAN055	ILanga PV	Artefacts	
130844	ILAN056	ILanga PV	Artefacts	
130845	ILAN057	ILanga PV	Artefacts	
130846	ILAN058	ILanga PV	Artefacts	
130847	ILAN059	ILanga PV	Artefacts	
130848	ILAN060	ILanga PV	Artefacts	
130849	ILAN061	ILanga PV	Artefacts	
130850	ILAN062	ILanga PV	Artefacts	
130851	ILAN063	ILanga PV	Artefacts	
130852	ILAN064	ILanga PV	Artefacts	
130853	ILAN065	ILanga PV	Artefacts	
130854	ILAN066	ILanga PV	Artefacts	
130855	ILAN067	ILanga PV	Artefacts	
130856	ILAN068	ILanga PV	Artefacts	
130857	ILAN069	ILanga PV	Artefacts	
130858	ILAN070	ILanga PV	Artefacts	
130859	ILAN071	ILanga PV	Artefacts	

130860	ILAN072	ILanga PV	Artefacts	
130861	ILAN073	ILanga PV	Artefacts	
130862	ILAN074	ILanga PV	Artefacts	
130863	ILAN075	ILanga PV	Artefacts	
130864	ILAN076	ILanga PV	Artefacts	
130865	ILAN077	ILanga PV	Artefacts	
130866	ILAN078	ILanga PV	Artefacts	
130867	ILAN079	ILanga PV	Artefacts	
130868	ILAN080	ILanga PV	Structures	
130869	ILAN081	ILanga PV	Artefacts	
130870	ILAN082	ILanga PV	Artefacts	
130871	ILAN083	ILanga PV	Artefacts	
130872	ILAN084	ILanga PV	Artefacts	
130873	ILAN085	ILanga PV	Artefacts	
130874	ILAN086	ILanga PV	Artefacts	
130875	ILAN087	ILanga PV	Artefacts	
130876	ILAN088	ILanga PV	Artefacts	
130877	ILAN089	ILanga PV	Artefacts	
130878	ILAN090	ILanga PV	Artefacts	
130879	ILAN091	ILanga PV	Artefacts	

130880	ILAN092	ILanga PV	Artefacts	
130881	ILAN093	ILanga PV	Artefacts	
130882	ILAN094	ILanga PV	Artefacts	
130883	ILAN095	ILanga PV	Artefacts	
130884	ILAN096	ILanga PV	Artefacts	
130885	ILAN097	ILanga PV	Artefacts	
130886	LANG098	ILanga PV	Artefacts	
130887	LANG099	ILanga PV	Artefacts	
130888	LANG100	ILanga PV	Artefacts	
130889	ILANG101	ILanga PV	Artefacts	
130890	ILANG102	ILanga PV	Artefacts	
130891	ILANG103	ILanga PV	Artefacts	
130892	ILANG104	ILanga PV	Artefacts	
130893	ILANG105	ILanga PV	Artefacts	
130894	ILANG106	ILanga PV	Artefacts	
130895	ILANG107	ILanga PV	Artefacts	
130897	ILAN109	ILanga PV	Artefacts	
130898	ILAN110	ILanga PV	Artefacts	
130899	ILAN111	ILanga PV	Artefacts	
130900	ILAN112		Artefacts	

130901	ILAN113	ILanga PV	Artefacts	
130902	ILAN114	ILanga PV	Artefacts	
130903	ILAN115	ILanga PV	Artefacts	
130904	ILAN116	ILanga PV	Artefacts	
130905	ILAN117	ILanga PV	Artefacts	
130906	ILAN118	ILanga PV	Artefacts	
130907	ILAN119	ILanga PV	Artefacts	
130908	ILAN120	ILanga PV	Artefacts	
130912	ILAN121	ILanga PV	Artefacts	
130913	ILAN122	ILanga PV	Artefacts	
130914	ILAN123	ILanga PV	Artefacts	
130915	ILAN124	ILanga PV	Artefacts	
130916	ILAN125	ILanga PV	Artefacts	
130917	ILAN126	ILanga PV	Artefacts	
130918	ILAN127		Artefacts	
130919	ILAN128	ILanga PV	Artefacts	
130920	ILAN129	ILanga PV	Artefacts	
130921	ILAN130	ILanga PV	Artefacts	
130922	ILAN131	ILanga PV	Artefacts	
130923	ILAN132	ILanga PV	Artefacts	

130924	ILAN133	ILanga PV	Artefacts	
130925	ILAN134	ILanga PV	Artefacts	
130926	ILAN135	ILanga PV	Artefacts	
130927	ILAN136	ILanga PV	Artefacts	
130928	ILAN137	ILanga PV	Artefacts	
130929	ILAN138	ILanga PV	Artefacts	
130930	ILAN139	ILanga PV	Artefacts	
130931	ILAN140	ILanga PV	Artefacts	
130932	ILAN141	ILanga PV	Artefacts	
130933	ILAN142	ILanga PV	Artefacts	
130934	ILAN143	ILanga PV	Artefacts	
130935	ILAN144	ILanga PV	Artefacts	
130936	ILAN145	ILanga PV	Artefacts	
130937	ILAN146	ILanga PV	Artefacts	
130938	ILAN147	ILanga PV	Artefacts	
130939	ILAN148	ILanga PV	Artefacts	
130940	ILAN149	ILanga PV	Artefacts	
130941	ILAN150	ILanga PV	Artefacts	
130942	ILAN151	ILanga PV	Artefacts	

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APPENDIX 2

Reference List with relevant AIAs and PIAs

Heritage Impact Assessments				
Nid	**Report Type**	**Author/s**	**Date**	**Title**
4119	AIA Phase 1	Jonathan Kaplan	01/08/2008	An Archaeological Assessment of Two Borrow Pits Alongside DR 3321 Uap, Northern Cape Province
4130	AIA Phase 1	Peter Beaumont	16/08/2006	Phase 1 Heritage Impact Assessment Report on a Planned Extension of the Louisvaleweg Township, //Khara Hais Municipality, Northern Cape Province
4132	AIA Phase 1	Peter Beaumont	18/08/2006	Phase 1 Heritage Impact Assessment Report on a Planned Extension Flanking Rondomstraat, //Khara Hais Municipality, Northern Cape Province
34135	HIA Phase 1	Stephan Gaigher	30/04/2012	Heritage Impact Assessment Report EIA Phase: Proposed Establishment of the Karoshoek Valley Solar Park Components on Sites 1.1, 1.3, 1.4, 2, 3, 4 & 5 on Sites Located South and East of Upingtone, Northern Cape Province
45016	HIA Phase 1	Johnny Van Schalkwyk	01/05/2011	Heritage Impact Assessment for the Proposed Establishment of the Ilanga Solar Thermal Power Plant near Upington, Northern Cape
49492	HIA Phase 1	Cobus Dreyer	09/09/2011	FIRST PHASE ARCHAEOLOGICAL & HERITAGE ASSESSMENT OF THE HOUSING DEVELOPMENTS AT MELKSTROOM 563, UPINGTON, NORTHERN CAPE
108359	HIA Phase 1	Cobus Dreyer	01/09/2011	FIRST PHASE ARCHAEOLOGICAL & HERITAGE ASSESSMENT OF THE HOUSING DEVELOPMENTS AT MELKSTROOM 563, UPINGTON, NORTHERN CAPE
111142	HIA Phase 1	Johnny Van Schalkwyk	01/03/2012	Heritage Impact Assessment for the Proposed Development of an Agri-estate on the Farm Melkstroom East of Upington, Gordonia Magisterial District, Northern Cape Province
117805	AIA Phase 1	Cobus Dreyer	18/04/2013	FIRST PHASE ARCHAEOLOGICAL & HERITAGE ASSESSMENT OF THE HOUSING DEVELOPMENTS AT MELKSTROOM 563, UPINGTON, NORTHERN CAPE
121280	HIA Phase 1	Robert de Jong	05/11/2010	FINAL HERITAGE IMPACT ASSESSMENT REPORT: PROPOSED LAND USE CHANGE TO PROVIDE FOR THE DEO GLORIA OLIVE ESTATE ON PORTION 67 AND THE

				REMAINDER OF THE FARM VAALKOPPIES 40 NEAR UPINGTON, KAI! GARIB MUNICIPALITY, NORTHERN CAPE PROVINCE
121413	AIA Phase 1	Johnny Van Schalkwyk	01/08/2010	Archaeological impact survey report for THE LAND USE CHANGE ON SECTIONS OF THE FARM VAALKOPPIES 40, GORDONIA DISTRICT, NORTHERN CAPE PROVINCE
130139	Archaeological Specialist Reports	Jonathan Kaplan	01/02/2013	ARCHAEOLOGICAL IMPACT ASSESSMENT THE PROPOSED UPGRADING OF THE LOUISEVALE ROAD WASTE WATER TREATMENT WORKS IN LOUISVALE
131589	Heritage Impact Assessment Specialist Reports	Stephan Gaigher	22/02/2013	Proposed Establishment of Several Electricity Distribution Lines within the Northern Cape Province
159293	HIA Phase 1	Johnny Van Schalkwyk	12/03/2014	Cultural Heritage Impact Assessment for proposed township development, Louisvaleweg, UPINGTON
162266	Heritage Impact Assessment Specialist Reports	Johnny Van Schalkwyk	31/05/2011	Heritage Impact Assessment for the Proposed Establishment of the Ilanga Solar Thermal Power Plant near Upington, Northern Cape Province
341377	HIA Phase 1	Jayson Orton	22/06/2015	
344305	PIA Desktop	John E Almond	13/11/2015	Palaeontological Heritage Assessment Desktop Study for the Additional CSP Facilities Associated with the Authorized CSP Sites (1.3, 1.4, 3, 4 & 5) within the Karoshoek Solar Valley Development near Upington, ZK Mgcawu Distrcitu, NC Province
344306	Heritage Scoping	Jaco van der Walt	13/11/2015	Archeological Scoping Report for the Additional CSP Facilities Associated with the Authorized CSP Sites (1.3, 1.4, 3, 4 & 5) within the Karoshoek Solar Valley Development near Upington, ZK Mgcawu Distrcitu, NC Province
351273	Palaeontological Specialist Reports	Barry Millsteed		FULL PALAEONTOLOGICAL HERITAGE IMPACT ASSESSEMENT REPORT ON THE SITE OF PROPOSED SOLAR ENERGY GENERATION FACILITIES (TEWA ISITHA SOLAR 1 AND 2) TO BE LOCATED ON THE REMAINING EXTENT OF THE FARM ALBANY 405 NEAR KAROS, NORTHERN CAPE PROVINCE
351279	Archaeological	Jaco van der Walt	02/12/2015	Archaeological Impact Assessment for the proposed Tewa Isitha Solar 1 PV Facility East Of Upington,

	Specialist Reports			Northern Cape Province.
351311	Archaeological Specialist Reports	Jaco van der Walt	02/12/2015	Archaeological Impact Assessment for the proposed Tewa Isitha Solar 2 PV Facility East Of Upington, Northern Cape Province.
354735	PIA Desktop	John Almond	16/11/2015	Palaeontological Heritage Assessment: Desktop Study for the Proposed Ilanga CSP 7, 8 & 9 facilities and associated infrastructure within the Karoshoek Solar Valley Development near Upington, NC Province
354743	Archaeological Specialist Reports	Jaco van der Walt	16/11/2015	Archaeological Scoping Report for the Ilanga CSP 7 & 8 facilities and associated infrastructure within the Karoshoek Solar Development near Upington, NC Province
361653	Heritage Impact Assessment Specialist Reports	Jaco van der Walt	18/04/2016	Archaeological Impact Assessment Report for the Proposed Establishment of the Ilganga CSP 2 Project, near Upington, Northern Cape Province
361654	Heritage Impact Assessment Specialist Reports	Jaco van der Walt	13/04/2016	Archaeological Impact Assessment Report for the Proposed Establishment of the Ilanga Tower 1 Project, near Upington, NC Province
363353	Archaeological Specialist Reports	Jaco van der Walt	12/04/2016	Archaeological Impact Assessment Report for the Ilanga CSP 3 Project, near Upington, Northern Cape Province
363356	Archaeological Specialist Reports	Jaco van der Walt	11/04/2016	Archaeological Impact Assessment Report for the Proposed Establishment of the Ilanga CSP 5 Project, near Upington, Northern Cape Province
363357	Archaeological Specialist Reports	Jaco van der Walt		Archaeological Impact Assessment Report for the Proposed Establishment of the Ilanga CSP 4 Project, near Upington, Northern Cape Province
365243	Archaeological Specialist Reports	Jaco van der Walt	20/06/2016	AIA for the proposed Ilanga Tower 1 project, near Upington, NC Province
365251	Archaeological Specialist Reports	Jaco van der Walt	20/06/2016	AIA for the proposed establishment of the Ilanga CSP 3 project, near Upington, NC Province
365252	Archaeological	Jaco van der Walt	20/06/2016	AIA for the proposed Ilanga CSP 5

	Specialist Reports			
365253	Archaeological Specialist Reports	Jaco van der Walt	20/06/2016	AIA for the Ilanga CSP 4
365889		Jaco van der Walt		Archaeological Impact Assessment Report

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APPENDIX 3 - Keys/Guides

Key/Guide to Acronyms

AIA	Archaeological Impact Assessment
DARD	Department of Agriculture and Rural Development (KwaZulu-Natal)
DEFF	Department of Environmental, Forestry and Fisheries (National)
DEADP	Department of Environmental Affairs and Development Planning (Western Cape)
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism (Eastern Cape)
DEDECT	Department of Economic Development, Environment, Conservation and Tourism (North West)
DEDT	Department of Economic Development and Tourism (Mpumalanga)
DEDTEA	Department of economic Development, Tourism and Environmental Affairs (Free State)
DENC	Department of Environment and Nature Conservation (Northern Cape)
DMR	Department of Mineral Resources (National)
GDARD	Gauteng Department of Agriculture and Rural Development (Gauteng)
HIA	Heritage Impact Assessment
LEDET	Department of Economic Development, Environment and Tourism (Limpopo)
MPRDA	Mineral and Petroleum Resources Development Act, no 28 of 2002
NEMA	National Environmental Management Act, no 107 of 1998
NHRA	National Heritage Resources Act, no 25 of 1999
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
VIA	Visual Impact Assessment

Full guide to Palaeosensitivity Map legend

	RED:	VERY HIGH - field assessment and protocol for finds is required
	ORANGE/YELLOW:	HIGH - desktop study is required and based on the outcome of the desktop study, a field assessment is likely
	GREEN:	MODERATE - desktop study is required
	BLUE/PURPLE:	LOW - no palaeontological studies are required however a protocol for chance finds is required
	GREY:	INSIGNIFICANT/ZERO - no palaeontological studies are required
	WHITE/CLEAR:	UNKNOWN - these areas will require a minimum of a desktop study.

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APPENDIX 4 - Methodology

The Heritage Screener summarises the heritage impact assessments and studies previously undertaken within the area of the proposed development and its surroundings. Heritage resources identified in these reports are assessed by our team during the screening process.

The heritage resources will be described both in terms of **type**:

- Group 1: Archaeological, Underwater, Palaeontological and Geological sites, Meteorites, and Battlefields
- Group 2: Structures, Monuments and Memorials
- Group 3: Burial Grounds and Graves, Living Heritage, Sacred and Natural sites
- Group 4: Cultural Landscapes, Conservation Areas and Scenic routes

and **significance** (Grade I, II, IIIa, b or c, ungraded), as determined by the author of the original heritage impact assessment report or by formal grading and/or protection by the heritage authorities.

Sites identified and mapped during research projects will also be considered.

DETERMINATION OF THE EXTENT OF THE INCLUSION ZONE TO BE TAKEN INTO CONSIDERATION

The extent of the inclusion zone to be considered for the Heritage Screener will be determined by CTS based on:

- the size of the development,
- the number and outcome of previous surveys existing in the area
- the potential cumulative impact of the application.

The inclusion zone will be considered as the region within a maximum distance of 50 km from the boundary of the proposed development.

DETERMINATION OF THE PALAEONTOLOGICAL SENSITIVITY

The possible impact of the proposed development on palaeontological resources is gauged by:

- reviewing the fossil sensitivity maps available on the South African Heritage Resources Information System (SAHRIS)
- considering the nature of the proposed development
- when available, taking information provided by the applicant related to the geological background of the area into account

DETERMINATION OF THE COVERAGE RATING ASCRIBED TO A REPORT POLYGON

Each report assessed for the compilation of the Heritage Screener is colour-coded according to the level of coverage accomplished. The extent of the surveyed coverage is labeled in three categories, namely low, medium and high. In most instances the extent of the map corresponds to the extent of the development for which the specific report was undertaken.

Low coverage will be used for:

- desktop studies where no field assessment of the area was undertaken;
- reports where the sites are listed and described but no GPS coordinates were provided.
- older reports with GPS coordinates with low accuracy ratings;
- reports where the entire property was mapped, but only a small/limited area was surveyed.
- uploads on the National Inventory which are not properly mapped.

Medium coverage will be used for

- reports for which a field survey was undertaken but the area was not extensively covered. This may apply to instances where some impediments did not allow for full coverage such as thick vegetation, etc.
- reports for which the entire property was mapped, but only a specific area was surveyed thoroughly. This is differentiated from low ratings listed above when these surveys cover up to around 50% of the property.

High coverage will be used for

- reports where the area highlighted in the map was extensively surveyed as shown by the GPS track coordinates. This category will also apply to permit reports.

RECOMMENDATION GUIDE

The Heritage Screener includes a set of recommendations to the applicant based on whether an impact on heritage resources is anticipated. One of three possible recommendations is formulated:

(1) The heritage resources in the area proposed for development are sufficiently recorded - The surveys undertaken in the area adequately captured the heritage resources. There are no known sites which require mitigation or management plans. No further heritage work is recommended for the proposed development.

This recommendation is made when:

- enough work has been undertaken in the area
- it is the professional opinion of CTS that the area has already been assessed adequately from a heritage perspective for the type of development proposed

(2) The heritage resources and the area proposed for development are only partially recorded - The surveys undertaken in the area have not adequately captured the heritage resources and/or there are sites which require mitigation or management plans. Further specific heritage work is recommended for the proposed development.

This recommendation is made in instances in which there are already some studies undertaken in the area and/or in the adjacent area for the proposed development. Further studies in a limited HIA may include:

- improvement on some components of the heritage assessments already undertaken, for instance with a renewed field survey and/or with a specific specialist for the type of heritage resources expected in the area
- compilation of a report for a component of a heritage impact assessment not already undertaken in the area

- undertaking mitigation measures requested in previous assessments/records of decision.

(3) The heritage resources within the area proposed for the development have not been adequately surveyed yet - Few or no surveys have been undertaken in the area proposed for development. A full Heritage Impact Assessment with a detailed field component is recommended for the proposed development.

Note:
The responsibility for generating a response detailing the requirements for the development lies with the heritage authority. However, since the methodology utilised for the compilation of the Heritage Screeners is thorough and consistent, contradictory outcomes to the recommendations made by CTS should rarely occur. Should a discrepancy arise, CTS will immediately take up the matter with the heritage authority to clarify the dispute.

APPENDIX 5 -Summary of Specialist Expertise

Jenna Lavin, an archaeologist with an MSc in Archaeology and Palaeoenvironments, and currently completing an MPhil in Conservation Management , heads up the heritage division of the organisation, and has a wealth of experience in the heritage management sector. Jenna's previous position as the Assistant Director for Policy, Research and Planning at Heritage Western Cape has provided her with an in-depth understanding of national and international heritage legislation. Her 8 years of experience at various heritage authorities in South Africa means that she has dealt extensively with permitting, policy formulation, compliance and heritage management at national and provincial level and has also been heavily involved in rolling out training on SAHRIS to the Provincial Heritage Resources Authorities and local authorities.

Jenna is a member of the Association of Professional Heritage Practitioners (APHP), and is also an active member of the International Committee on Monuments and Sites (ICOMOS) as well as the International Committee on Archaeological Heritage Management (ICAHM). In addition, Jenna has been a member of the Association of Southern African Professional Archaeologists (ASAPA) since 2009. Recently, Jenna has been responsible for conducting training in how to write Wikipedia articles for the Africa Centre's WikiAfrica project.

Since 2016, Jenna has drafted over 100 Heritage Impact Assessments throughout South Africa.